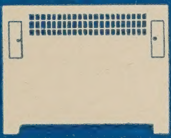
CRANE CONCEALED CAST IRON RADIATORS

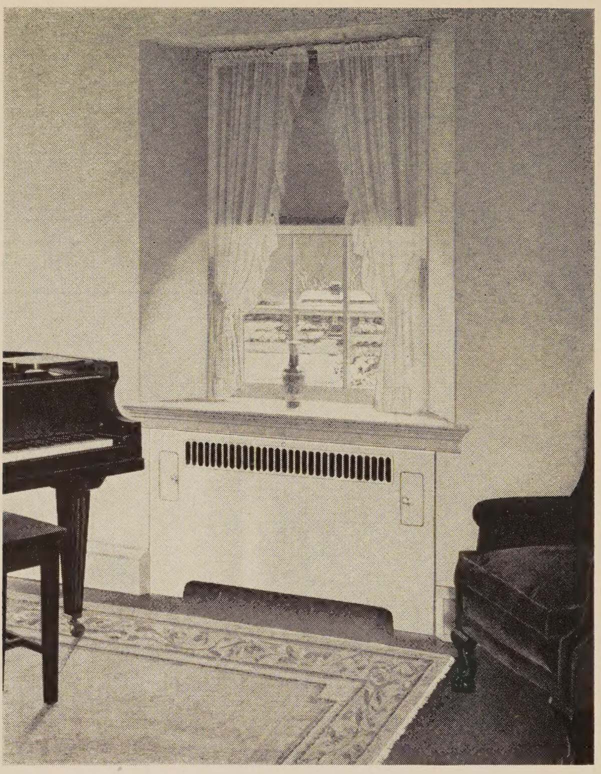


Copyright Crane Co., Sept. 1932

THE NAME CRANE REG. U. S. PAT. OFF

ANNOUNCING

A COMPLETE NEW LINE OF CRANE CONCEALED CAST IRON RADIATORS FOR HOT WATER, STEAM, VAPOR AND VACUUM SYSTEMS



No compromise either with heating efficiency or room decoration is necessary when you specify Crane Concealed Cast Iron Radiators. These radiators, designed after years of study, completely solve the problem of combining modern comfort with modern decorative beauty. The room above shows how charmingly these new heaters fit into a beautiful interior.

77

years of experience
produce an amazing
achievement

•

NEW CRANE CONCEALED CAST IRON RADIATORS

•

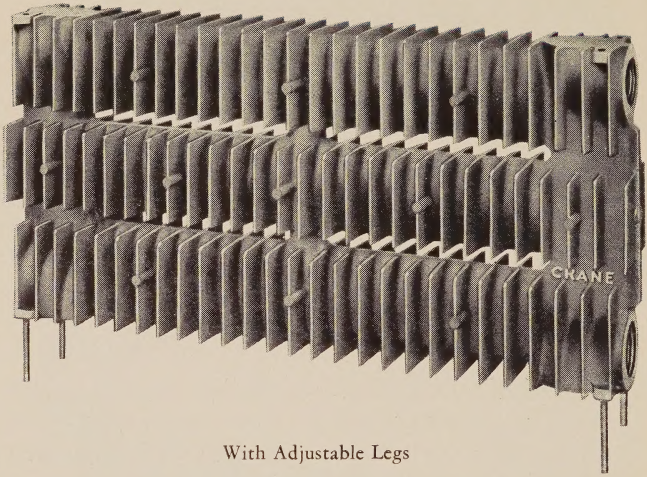
NOW Crane Co. offers you the new Crane Concealed Cast Iron Radiators . . . from any standpoint the complete answer to modern demands for a radiator that combines maximum beauty with maximum heating efficiency.

Hidden! These new Crane Concealed Cast Iron Radiators are so compact that they can be built into the wall behind an ornamental grille or enclosed in beautiful unobtrusive cabinets.

Cast Iron Heating Efficiency! Cast iron's greater heat convection value, freedom from corrosion or electrolysis, proved superiority as a metal for radiators, is here offered in a design exclusively Crane, to give fullest flow of comfortably heated air out into the room rather than relatively small volumes of "superheated" air.

Cast Iron Durability! Each section is cast in a single piece, the fins integral, of the most durable metal known for radiators . . . eliminating noise, leaks, and other sources of trouble.

77 Years of Experience! More than three quarters of a century of experience, tested design and the most careful construc-



With Adjustable Legs

tion, back these Crane radiators. They are the product not of a small inexperienced or unknown company but of an organization with a well proved reputation for dependability.

After years of development work, Crane heating engineers have perfected this amazing new line of radiators . . . in a full range of sizes to meet all requirements of steam, hot water, vapor and vacuum heating systems, without any special piping arrangements. On them, Crane Co., with its strict sense of responsibility to the trade and to the public, places its stamp of approval.

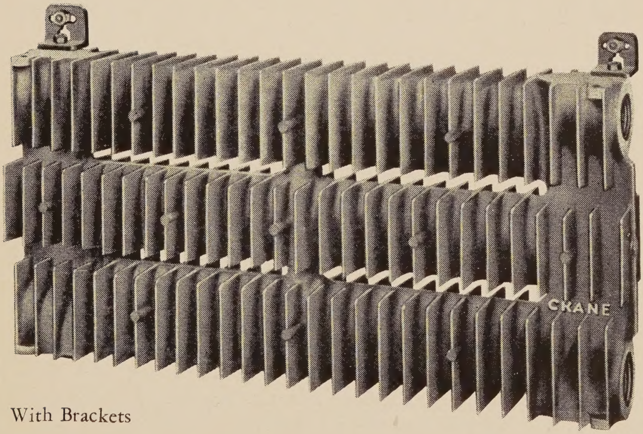
Their design is exclusively Crane, at many points a distinct step in advance of concealed radiators of the past. You will find these points listed and explained on pages 24-25. Consider them well.

Built with characteristic Crane care and accuracy, Crane Concealed Cast Iron Radiators assemble readily in perfect alignment. When you specify them, you will know that there will be no troublesome fitting and planning to be done on the job. For that has all been done in advance . . by Crane.

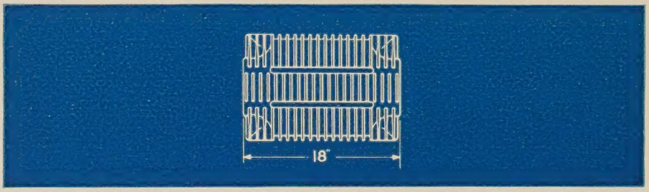
They are made in three sizes of units . . . 18, 24, and 30 inches long. Thus it is possible to connect them in any combination of the above lengths, increasing by six inches at a step. They can also be assembled in single, double or triple depths. Thus is offered the greatest flexibility in applying radiation to the space to be heated.

They are 3½ inches wide and 12 inches high. They have 1½-inch tappings, either at the ends or at the top and bottom, as required for any installation.

Specify and install them, with full confidence that you are serving your customers well.



With Brackets

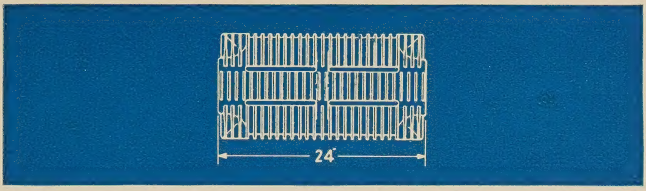


18″ RADIATOR RATINGS

For Front or Top Outlet Enclosures

Depth of Radiator	3½″ Single	7⅛″ Double	10¾″ Triple
Enclosure Height	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.
20″	10.1	20.2	27.3
22″	10.4	20.8	28.1
24″	10.6	21.2	28.7
26″	10.8	21.6	29.2
28″	11.1	22.2	30.0
30″	11.3	22.6	30.6
35″	11.9	23.8	32.2
40″	12.5	25.0	33.8
45″	13.0	26.0	35.1
50″	13.1	26.2	35.4
55″	13.2	26.4	35.7
60″	13.3	26.6	36.0
65″	13.4	26.8	36.2

Instructions for ordering radiators, see page 23.
For typical installations, see pages 20 and 21.
For enclosures, see pages 26 to 37, inclusive.

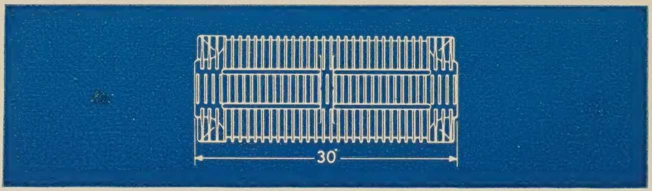


24" RADIATOR RATINGS

For Front or Top Outlet Enclosures

Depth of Radiator	3½" Single	7⅛" Double	10¾" Triple
Enclosure Height	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.
20"	13.5	27.0	36.5
22"	13.8	27.6	37.3
24"	14.1	28.2	38.1
26"	14.4	28.8	38.9
28"	14.7	29.4	39.7
30"	15.0	30.0	40.5
35"	15.8	31.6	42.7
40"	16.6	33.2	44.9
45"	17.4	34.8	47.0
50"	17.5	35.0	47.3
55"	17.6	35.2	47.6
60"	17.7	35.4	47.8
65"	17.9	35.8	48.4

Instructions for ordering radiators, see page 23.
For typical installations, see pages 20 and 21.
For enclosures, see pages 26 to 37, inclusive.



30" RADIATOR RATINGS

For Front or Top Outlet Enclosures

Depth of Radiator	3½" Single	7⅛" Double	10¾" Triple
Enclosure Height	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.
20"	16.9	33.8	45.7
22"	17.3	34.6	46.8
24"	17.6	35.2	47.6
26"	18.0	36.0	48.6
28"	18.4	36.8	49.7
30"	18.8	37.6	50.8
35"	19.8	39.6	53.5
40"	20.8	41.6	56.2
45"	21.7	43.4	58.6
50"	21.9	43.8	59.2
55"	22.0	44.0	59.4
60"	22.2	44.4	60.0
65"	22.3	44.6	60.3

Instructions for ordering radiators, see page 23.
For typical installations, see pages 20 and 21.
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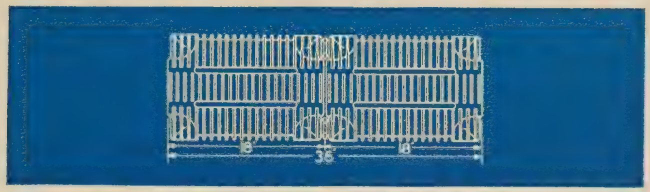
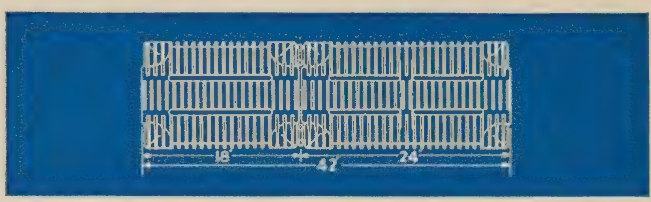


36″ RADIATOR RATINGS

For Front or Top Outlet Enclosures

Depth of Radiator	3½″ Single	7⅛″ Double	10¾″ Triple
Enclosure Height	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.	Sq. Ft E.D.R.
20″	20.2	40.4	54.6
22″	20.7	41.4	55.9
24″	21.2	42.4	57.3
26″	21.6	43.2	58.4
28″	22.1	44.2	59.7
30″	22.6	45.2	61.1
35″	23.8	47.6	64.3
40″	24.9	49.8	67.3
45″	26.1	52.2	70.5
50″	26.2	52.4	70.8
55″	26.4	52.8	71.3
60″	26.6	53.2	71.9
65″	26.8	53.6	72.4

Instructions for ordering radiators, see page 23.
For typical installations, see pages 20 and 21.
For enclosures, see pages 26 to 37, inclusive.

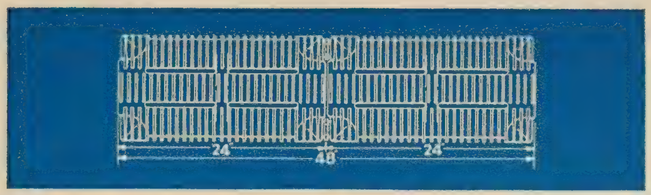


42″ RADIATOR RATINGS

For Front or Top Outlet Enclosures

Depth of Radiator	3½″ Single	7⅛″ Double	10¾″ Triple
Enclosure Height	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.
20″	23.6	47.2	63.8
22″	24.2	48.4	65.4
24″	24.7	49.4	66.7
26″	25.2	50.4	68.1
28″	25.8	51.6	69.7
30″	26.3	52.6	71.1
35″	27.7	55.4	74.8
40″	29.1	58.2	78.6
45″	30.4	60.8	82.1
50″	30.6	61.2	82.7
55″	30.8	61.6	83.2
60″	31.0	62.0	83.7
65″	31.2	62.4	84.3

Instructions for ordering radiators, see page 23.
For typical installations, see pages 20 and 21.
For enclosures, see pages 26 to 37, inclusive.

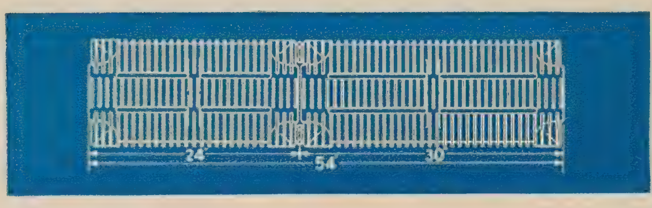


48″ RADIATOR RATINGS

For Front or Top Outlet Enclosures

Depth of Radiator	3½″ Single	7⅛″ Double	10¾″ Triple
Enclosure Height	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.
20″	27.0	54.0	72.9
22″	27.6	55.2	74.6
24″	28.2	56.4	76.2
26″	28.8	57.6	77.8
28″	29.5	59.0	79.7
30″	30.1	60.2	81.3
35″	31.7	63.4	85.6
40″	33.2	66.4	89.7
45″	34.8	69.6	94.0
50″	35.0	70.0	94.5
55″	35.2	70.4	95.1
60″	35.5	71.0	95.9
65″	35.7	71.4	96.4

Instructions for ordering radiators, see page 23.
For typical installations, see pages 20 and 21.
For enclosures, see pages 26 to 37, inclusive.

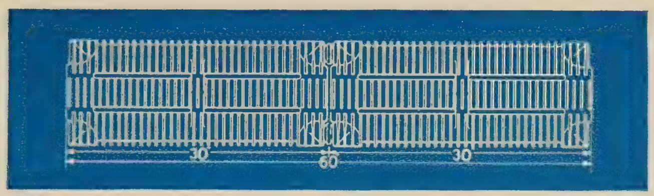


54″ RADIATOR RATINGS

For Front or Top Outlet Enclosures

Depth of Radiator	3½″ Single	7⅛″ Double	10¾″ Triple
Enclosure Height	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.
20″	30.3	60.6	81.9
22″	31.1	62.2	84.0
24″	31.8	63.6	85.9
26″	32.5	65.0	87.8
28″	33.2	66.4	89.7
30″	33.9	67.8	91.6
35″	35.6	71.2	96.2
40″	37.4	74.8	101.0
45″	39.1	78.2	105.6
50″	39.4	78.8	106.2
55″	39.6	79.2	107.0
60″	39.9	79.8	107.8
65″	40.2	80.4	108.6

Instructions for ordering radiators, see page 23.
For typical installations, see pages 20 and 21.
For enclosures, see pages 26 to 37, inclusive.

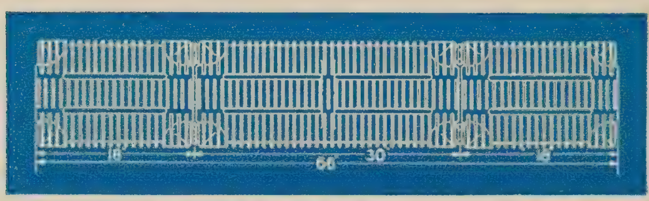


60″ RADIATOR RATINGS

For Front or Top Outlet Enclosures

Depth of Radiator	3½″ Single	7⅛″ Double	10¾″ Triple
Enclosure Height	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.
20″	33.7	67.4	91.0
22″	34.5	69.0	93.2
24″	35.3	70.6	95.4
26″	36.1	72.2	97.5
28″	36.8	73.6	99.4
30″	37.6	75.2	101.6
35″	39.6	79.2	107.0
40″	41.5	83.0	112.1
45″	43.4	86.8	117.2
50″	43.7	87.4	118.0
55″	44.0	88.0	118.8
60″	44.3	88.6	119.7
65″	44.6	89.2	120.5

Instructions for ordering radiators, see page 23.
For typical installations, see pages 20 and 21.
For enclosures, see pages 26 to 37, inclusive.

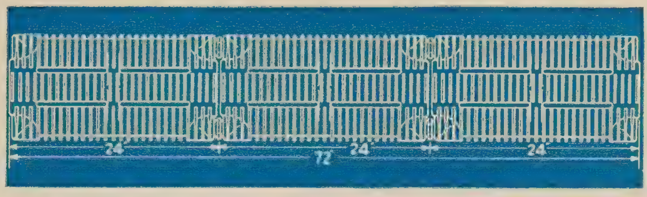


66″ RADIATOR RATINGS

For Front or Top Outlet Enclosures

Depth of Radiator	3½″ Single	7⅛″ Double	10¾″ Triple
Enclosure Height	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.
20″	37.1	74.2	100.2
22″	38.0	76.0	102.6
24″	38.8	77.6	104.8
26″	39.7	79.4	107.2
28″	40.5	81.0	109.4
30″	41.4	82.8	111.8
35″	43.6	87.2	117.8
40″	45.7	91.4	123.4
45″	47.8	95.6	129.1
50″	48.1	96.2	129.9
55″	48.4	96.8	130.7
60″	48.8	97.6	131.8
65″	49.1	98.2	132.6

Instructions for ordering radiators, see page 23.
For typical installations, see pages 20 and 21.
For enclosures, see pages 26 to 37, inclusive.

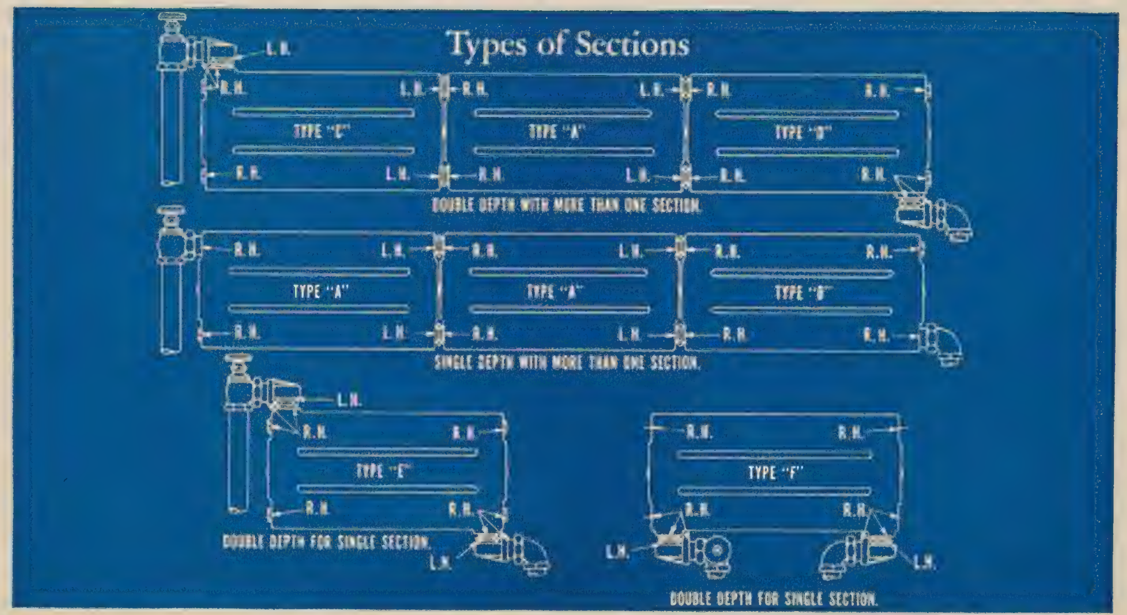


72″ RADIATOR RATINGS

For Front or Top Outlet Enclosures

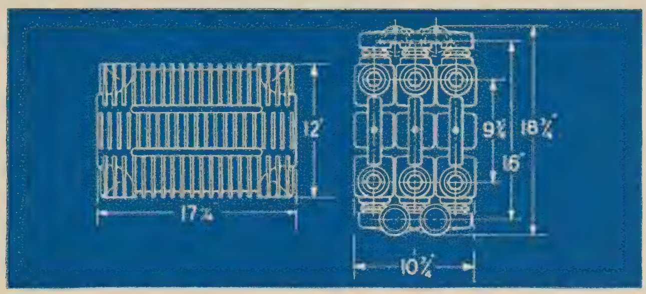
Depth of Radiator	3½″ Single	7⅛″ Double	10¾″ Triple
Enclosure Height	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.	Sq. Ft. E.D.R.
20″	40.5	81.0	109.4
22″	41.4	82.8	111.8
24″	42.3	84.6	114.3
26″	43.3	86.6	117.0
28″	44.2	88.4	119.4
30″	45.1	90.2	121.8
35″	47.5	95.0	128.3
40″	49.8	99.6	134.5
45″	52.1	104.2	140.7
50″	52.5	105.0	141.8
55″	52.9	105.8	142.9
60″	53.2	106.4	143.7
65″	53.6	107.2	144 8

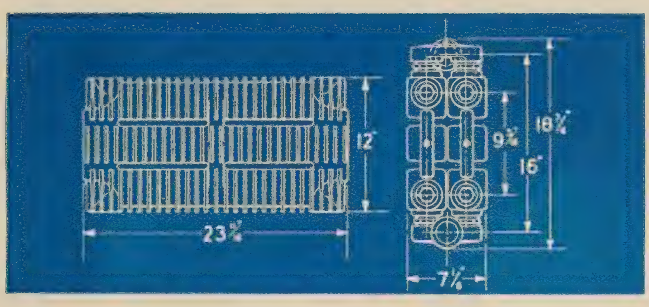
Instructions for ordering radiators, see page 23.
For typical installations, see pages 20 and 21.
For enclosures, see pages 26 to 37, inclusive.

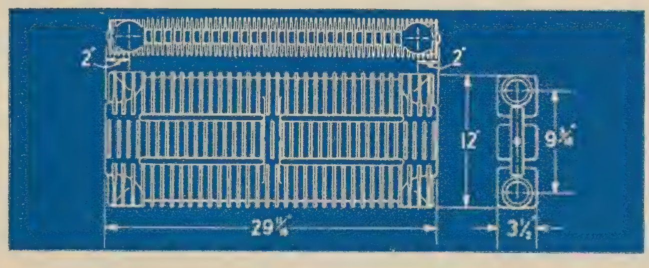


Illustrated above are the different types of sections which can be furnished to meet all requirements. Note particularly that they can be tapped on ends, top, or bottom.

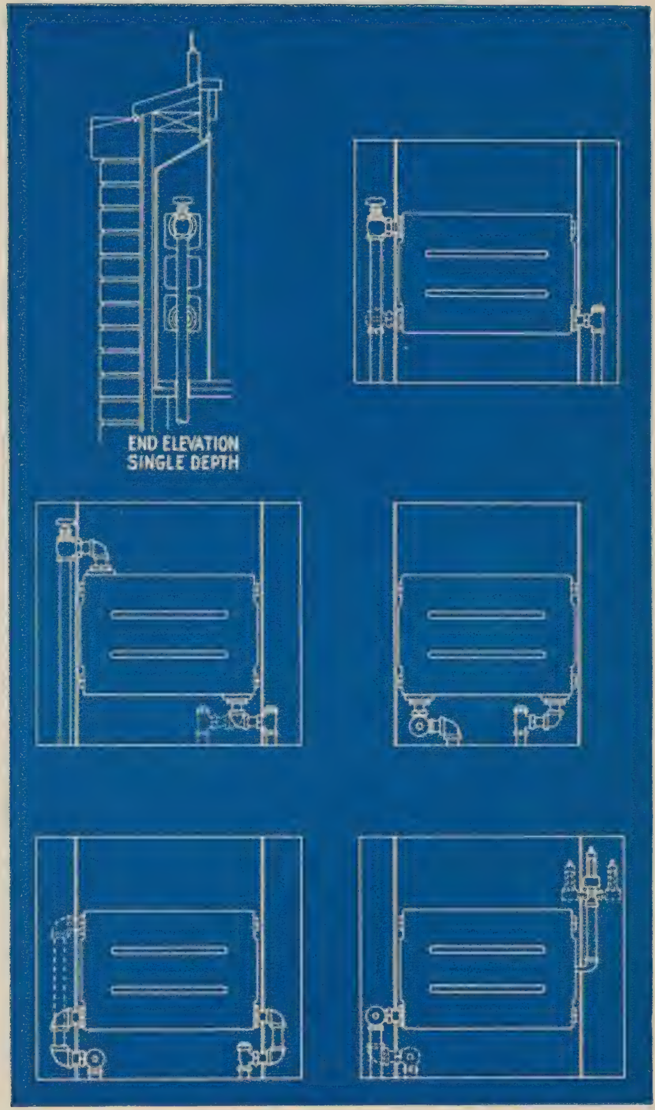
Radiator Dimensions



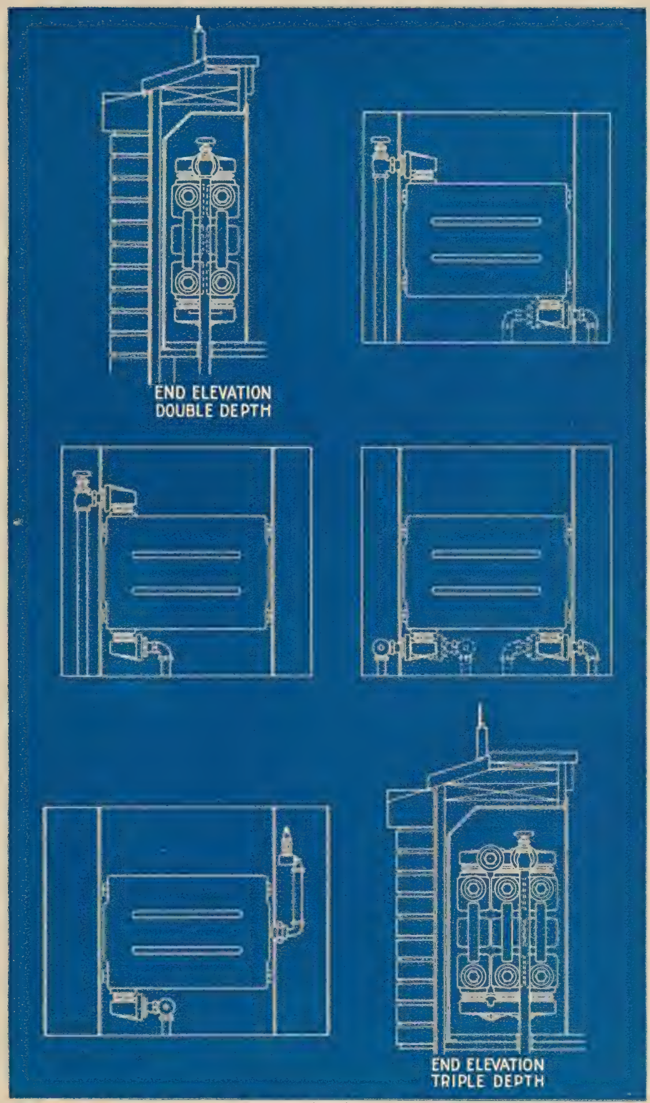




Typical Piping Schemes



Typical Piping Schemes



Radiator Tapping *and* Bushing Data

Crane Concealed Cast Iron Radiators are tapped 1½ inch right hand thread for supply and return, and will be bushed as listed below *when specified.*

One-Pipe Work—Steam

Radiators containing 24 square feet and under	1 inch
Above 24, but not exceeding 60 square feet	1¼ inch
Above 60	1½ inch

Two-Pipe Work—Steam

Radiators containing 48 square feet and under	1 x ¾ inch
Above 48, but not exceeding 96 square feet	1¼ x 1 inch
Above 96 square feet	1½ x 1¼ inch

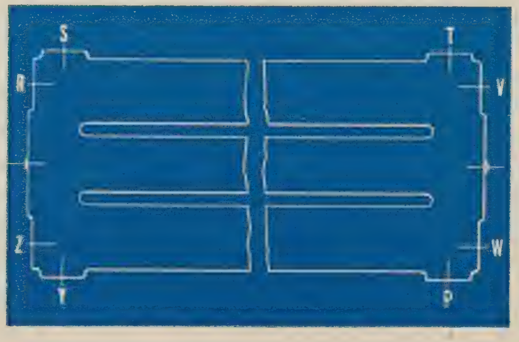
Water—Supply and Return

Radiators containing 40 square feet and under	1 inch
Above 40, but not exceeding 72 square feet	1¼ inch
Above 72 square feet	1½ inch

Vapor

Radiators containing 30 square feet and under	½ x ½ inch eccentric
Above 30 feet, not exceeding 60 square feet	¾ x ½ inch eccentric
Above 60 feet, not exceeding 125 square feet	1 x ½ inch eccentric
Above 125 square feet	1¼ x ½ inch eccentric

When radiators are ordered for special systems, specific instructions should be given as to size of bushings. All air valve tappings are ⅛ inch.



Universal radiator indicating tappings.

Instructions for Ordering CRANE Concealed Cast Iron Radiators

CRANE Concealed Cast Iron Radiators are made in three lengths, namely, 18″, 24″ and 30″, all of which are 3½″ wide and 12″ high (see Page 19 for more complete dimensions). For radiators longer than 30″ these units are connected with right and left hand hexagon nipples, making assemblies available in any lengths, increasing in 6″ increments. The threaded openings are set back so that the hexagon nipples do not increase the overall length of the assembled units. For safety in shipping and ease of handling, each section is packed in a separate crate.

The sections are regularly furnished with 1½″ tapped openings on either the ends, top or bottom as specified, and will be bushed as desired. Installations may be made in double or triple depths, using specially designed manifolds. See Page 18 for the different types of sections as determined by tappings and Page 22 for tapping and bushing data.

To select the proper size of radiator, it is necessary to know the amount of radiation required, the style of piping connection to be used, together with height and depth of recess. For example, if an installation requires fifty-nine square feet of steam radiation and has a recess large enough to accommodate an enclosure 28″ high by 7½″ deep, a 48″ double depth radiator Page 13, tapped and bushed to meet piping requirements, would be selected. Thus the order should read:

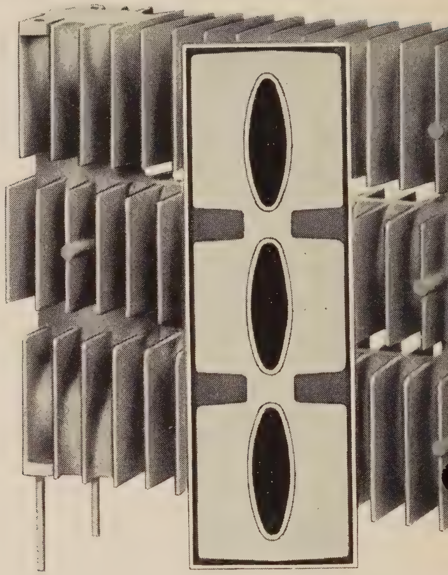
> 1—48″ Double Depth Concealed Cast Iron Radiator, manifolds at S and P, bushed 1¼″ x 1″ steam.

Second example, if an installation requires 27 square feet of steam radiation and has a recess large enough to accommodate an enclosure 20″ high by 3¾″ deep, a 48″ single depth radiator Page 13, tapped and bushed to meet piping requirements, would be selected. Thus the order should read:

> 1—48″ Single Depth Concealed Cast Iron Radiator, bushed R 1″ x W ¾″ steam.

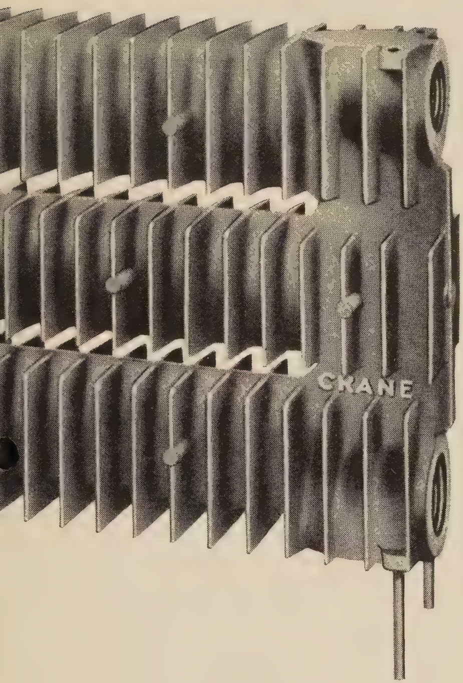
Be sure to specify whether hot water, steam or vapor.

Advanced features of CRAN



1. Maximum heat output for the space occupied.
2. Ease of installation. Accurately fitted and aligned.
3. Ample and uniform spacing between fins. Provides accessibility for cleaning when necessary.
4. Free circulation. No obstruction of the heating medium within the radiator.
5. Unrestricted air flow over heating surfaces provides maximum quantity of warmed air, resulting in more effective heating.
6. Freedom from air pockets and water logging.
7. Cast in one piece. For the fewer the joints the less chance of leaks.
8. Units sized for flexibility. So sized as to afford ready application to footage requirements either in width or length.
9. For hot water, steam, vapor and vacuum heating systems.
10. Note the extra large waterways, affording heat storage capacity to prevent too rapid cooling and preserving better balance on systems where both standard radiators and concealed radiators are used. See cross section above.

Concealed Cast Iron Radiators



11. Sturdy cast iron construction, unaffected by contraction and expansion. Noiseless.
12. Cast iron integral fin construction, the most durable material and design known in heating work, with no welded, brazed or soldered joints to cause leaks or inefficient thermal contacts.
13. Complete venting of the air as readily as from a standard radiator.
14. Provision for top, bottom and end tappings. Permits any assembly in width or length and adaptable to all piping requirements.
15. Adjustable supporting legs or wall brackets.
16. Enclosures harmonizing with architectural and decorative plan of room.

Enclosures

To blend into the harmony of the room we offer enclosures that please. Simple to install, they can be procured in designs of removable sheet metal or for permanent plaster front finish. They are available in natural wood finish or with prime coat. The wide variety of grilles meet the requirements of individual taste. Standard designs are illustrated and described on the following pages.

Directions for Ordering Enclosures

Enclosures are made for Crane concealed cast iron radiators up to 72″ in length, inclusive. They are made in a variety of styles as shown on Pages 27 to 37 inclusive, and may be had with any of the attractive grille designs shown on Page 36. Enclosures are regularly furnished with gray baked priming coat to permit any type of finish desired. Other finishes are also available on special order.

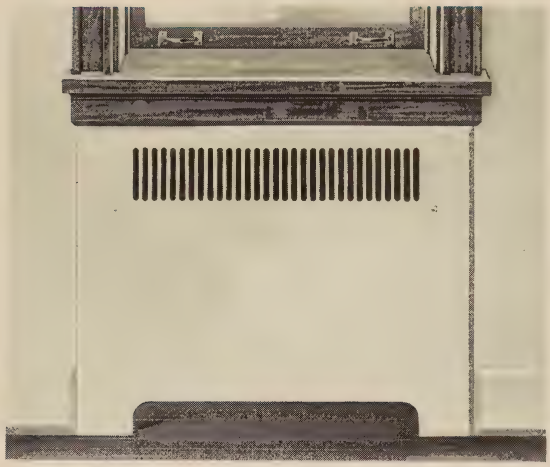
In selecting the enclosure, it is necessary to consider the size of radiator, type of piping connections to be used and, of course, the style of grille desired. For example, the order should read:

> 1—Enclosure Type MF-1, with slotted grille, for 48″ double depth concealed cast iron radiator.

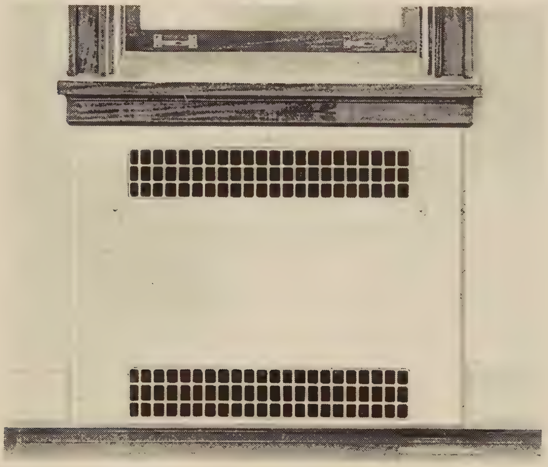
We strongly recommend that the back and ends of the enclosure be well insulated to avoid heat loss. Insulation will be furnished with these enclosures when so ordered.

Baffles for the ends of the radiator are furnished without charge. These baffles confine the air circulation to the full length of the radiator instead of the full length of enclosure.

Enclosures

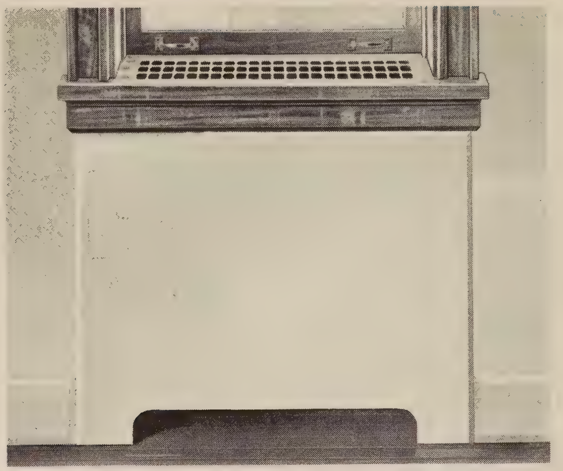


MF-1—Metal enclosure with grilled outlet and open inlet. Front panel fits flush to finished plaster wall with dust-proof felt joints. The panel and grille are easily removed. Doors on each side give easy access to valves.

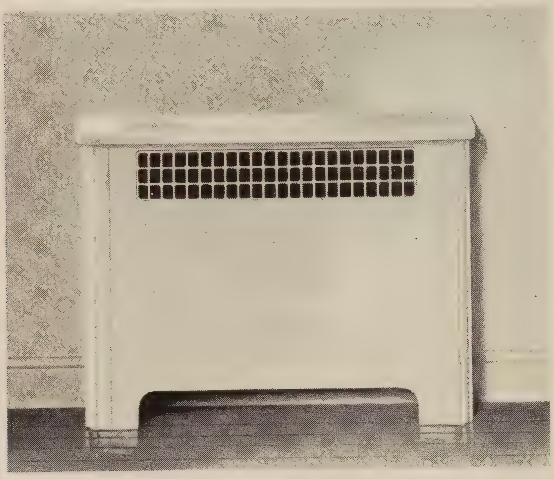


MF-2—Metal enclosure with grilled inlet and outlet. Front panel fits flush to finished plaster wall with dust-proof felt joints. The panel and grille are easily removed. Doors on each side give easy access to valves.

Enclosures

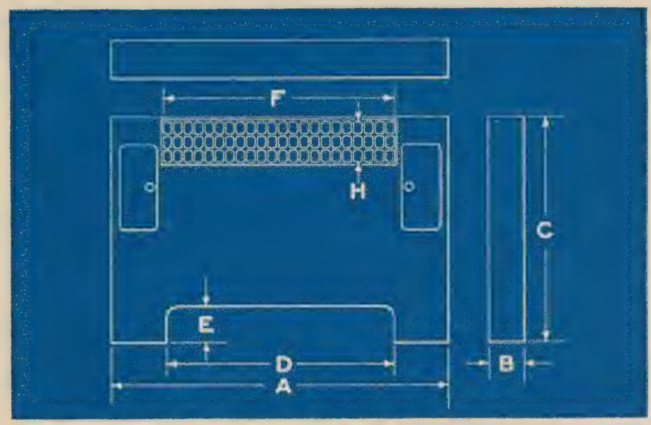


MT-1—Metal enclosure with grilled top outlet and open inlet. Front panel fits flush to finished plaster wall with dust-proof felt joints. The panel is easily removed. Doors on each side give easy access to valves.

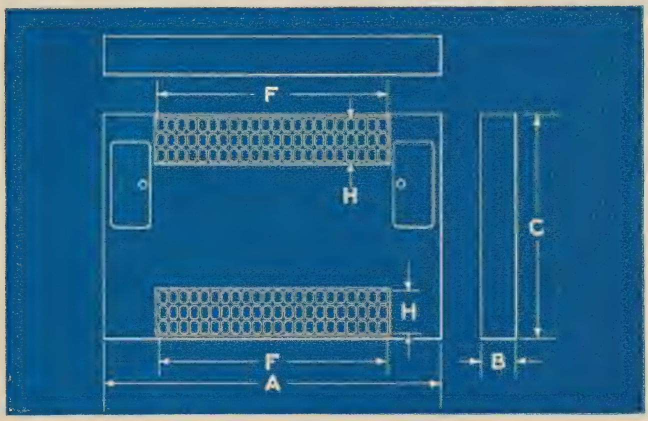


WF-1—An innovation in concealed radiator enclosure. This all-metal enclosure fits tightly to wall and permits use of Crane Concealed radiator without necessity of recessing.

Enclosures



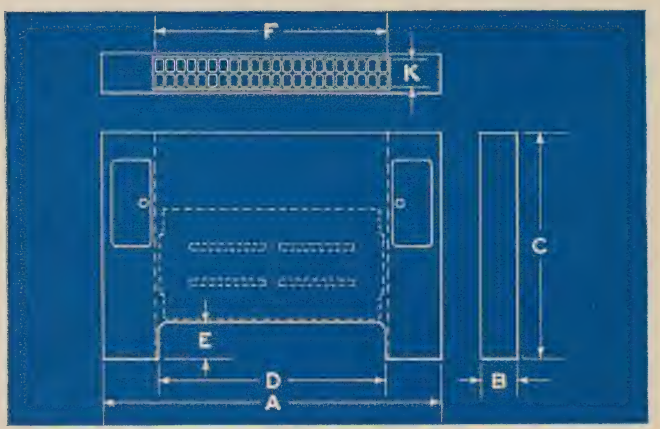
MF-1
Metal enclosure with grilled outlet and open inlet.



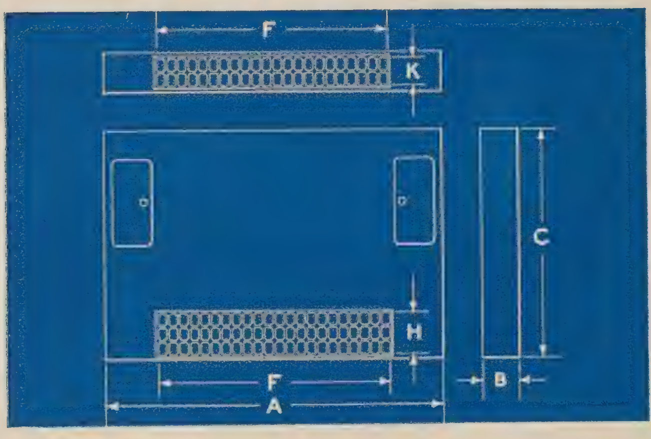
MF-2
Metal enclosure with grilled inlet and outlet.

See page 37 for general dimensions.
See page 36 for grilles.
See page 26 for instructions on ordering.

Enclosures



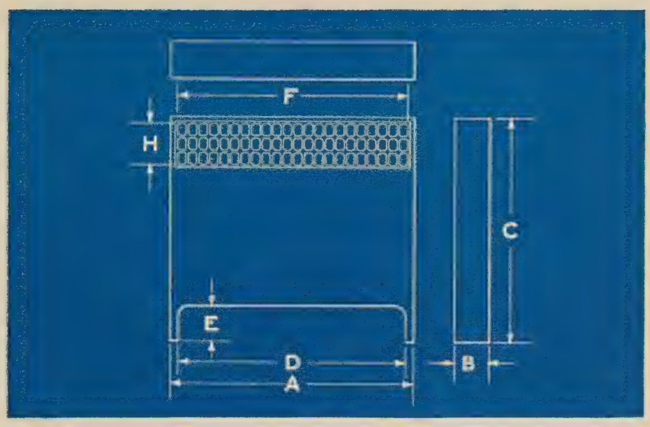
MT-1
Metal enclosure with grilled top outlet and open inlet.



MT-2
Metal enclosure with grilled inlet and top outlet.

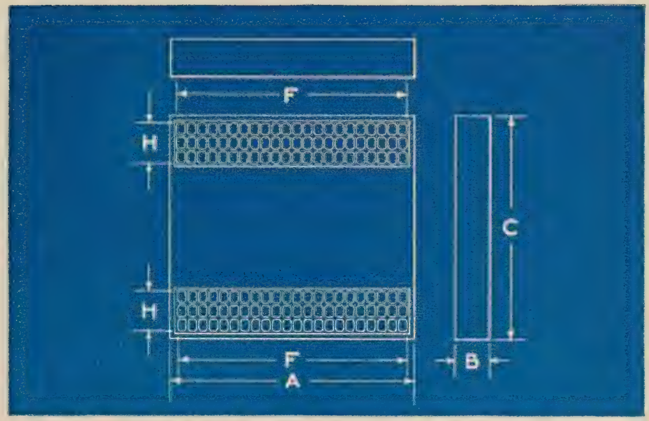
See page 37 for general dimensions.
See page 36 for grilles.
See page 26 for instructions on ordering.

Enclosures



MFS-1 or PFS-1

Short type metal or plaster front enclosures with grilled outlet and open inlet.

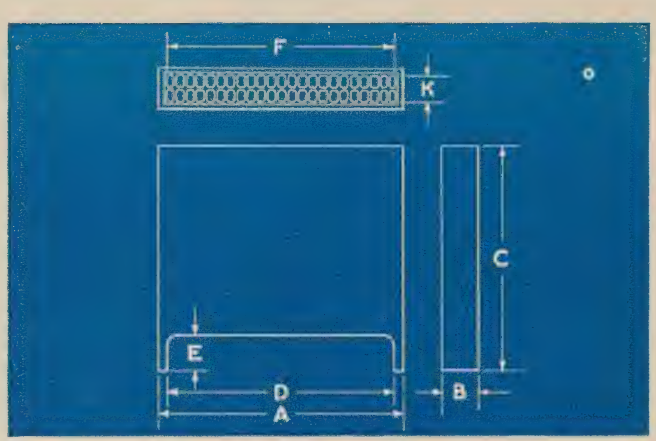


MFS-2 or PFS-2

Short type metal or plaster front enclosures with grilled inlet and outlet.

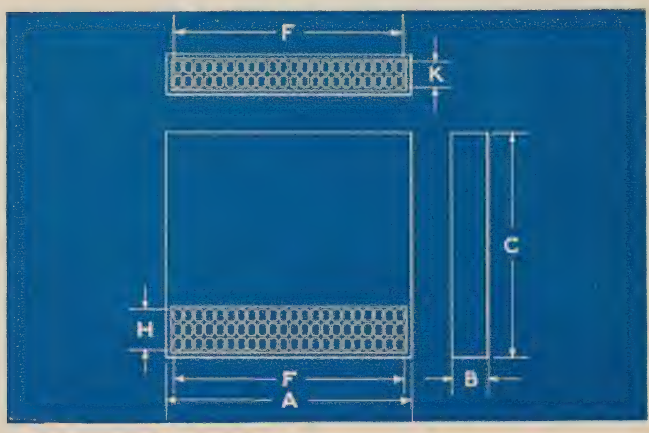
See page 37 for general dimensions.
See page 36 for grilles.
See page 26 for instructions on ordering.

Enclosures



MTS-1 or PTS-1

Short type metal or plaster front enclosures with grilled top outlet and open inlet.

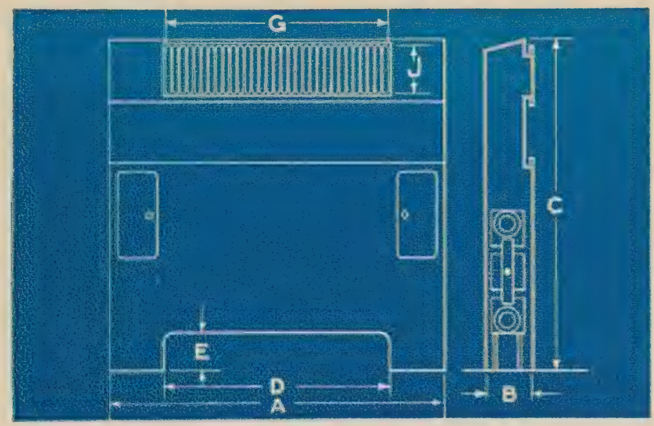


MTS-2 or PTS-2

Short type metal or plaster front enclosures with grilled inlet and top outlet.

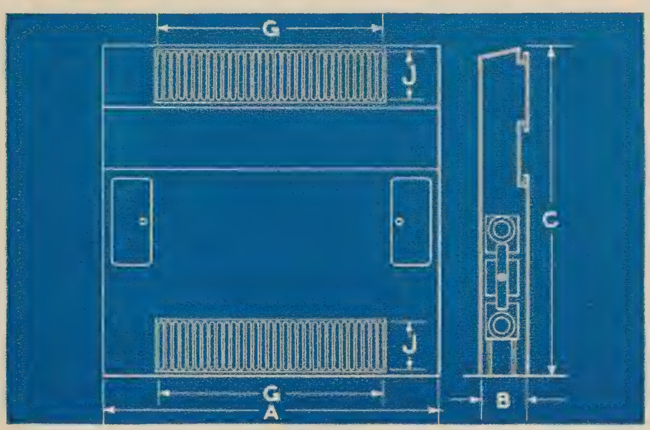
See page 37 for general dimensions.
See page 36 for grilles.
See page 26 for instructions on ordering.

Enclosures



PF-1

Metal enclosure with plaster strip having grilled outlet and open inlet.

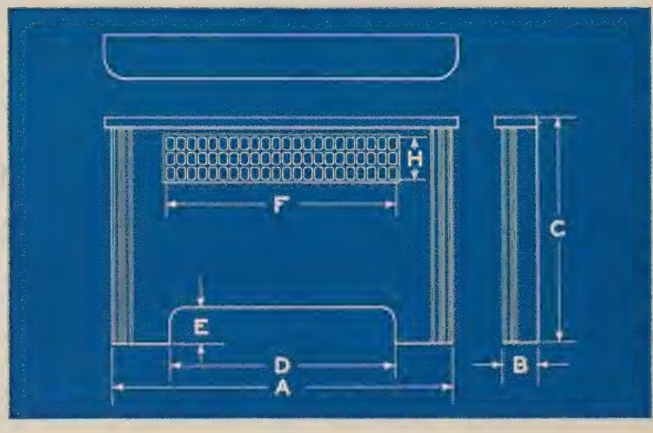


PF-2

Metal enclosure with plaster strip having grilled inlet and outlet.

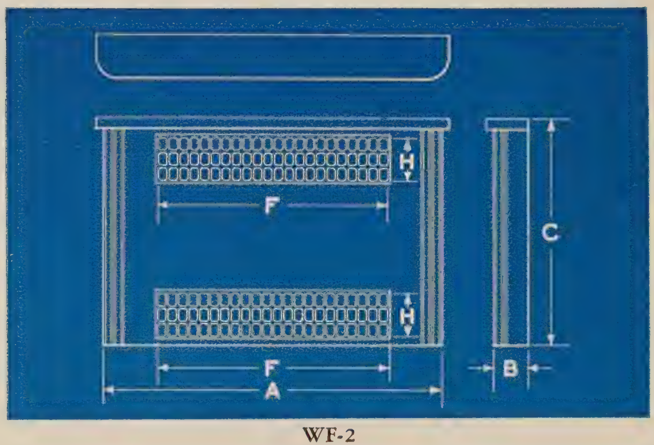
See page 37 for general dimensions.
See page 36 for grilles.
See page 26 for instructions on ordering.

Cabinet Enclosures



WF-1

Wall type metal enclosures with grilled outlet and open inlet.

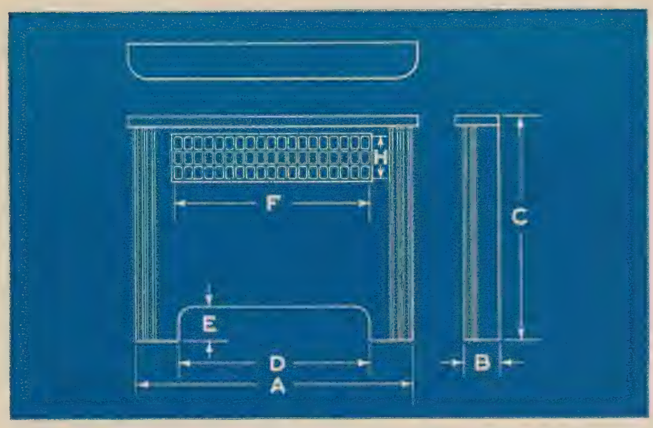


WF-2

Wall type metal enclosures with grilled inlet and outlet.

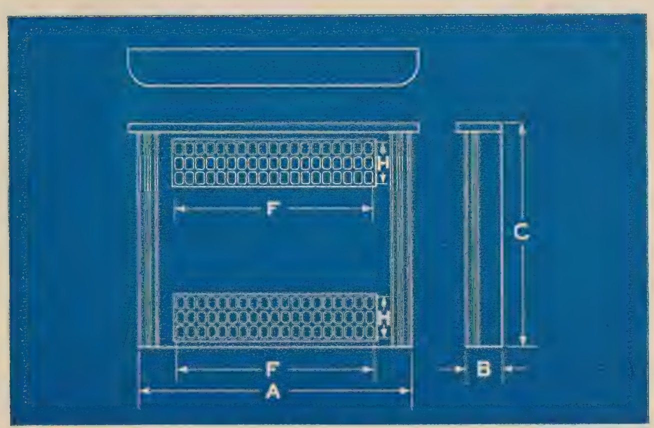
See page 37 for general dimensions.
See page 36 for grilles.
See page 26 for instructions on ordering.

Cabinet Enclosures



WFS-1

Short type wall metal enclosure with grilled outlet and open inlet.

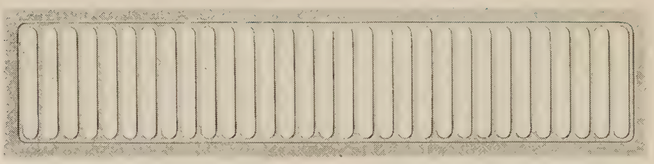


WFS-2

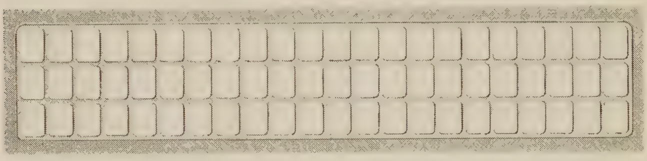
Short type wall metal enclosure with grilled inlet and outlet.

See page 37 for general dimensions.
See page 36 for grilles.
See page 26 for instructions on ordering.

Grilles

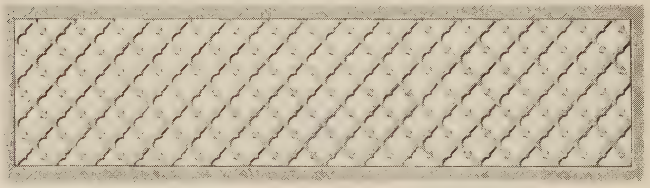


Slotted design

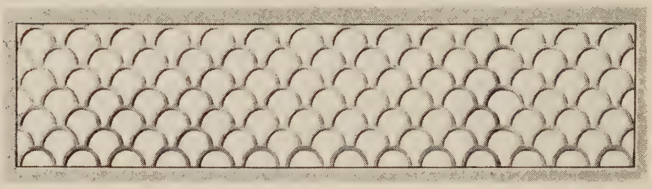


Squared design

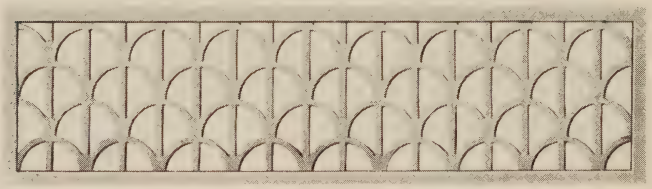
Above grilles are regularly furnished on all enclosures. Design optional.



Large Gothic design



Large Shell design



Divided Shell design

Above grilles furnished on special order only.

ENCLOSURE DIMENSIONS—INCHES

Size of Radiator		18	24	30	36	42	48	54	60	66	72
A—Length	Types MF, MT, PF, WF	30	36	42	48	54	60	66	72	78	84
	Types MFS, MTS, PFS, PTS	19	25	31	37	43	49	55	61	67	73
	Type WFS	24	30	36	42	48	54	60	66	72	78
B—Depth	Single	3¾									
	Double	7½									
	Triple	11									
C—Height		*Can be had in Heights of 20, 22, 24, 26, 28, 30, 35, 40, 45, 50, 55, 60, 65									
D—Length of Inlet Opening		16½	22½	28½	34½	40½	46½	52½	58½	64½	70½
E—Height of Inlet Opening	Single	3¾									
	Double	5									
	Triple	5									
F—Length of Squared Grille		17⅞	23½	29⅛	35⅞	41½	47⅛	53⅞	59½	65⅛	71⅞
G—Length of Slotted Grille		16⅞	23⅜	29 1/16	35 9/16	41¼	47¾	53 7/16	59⅛	65⅝	71 5/16
H—Width of Squared Grille	Single	4⅜									
	Double	5⅞									
	Triple	5⅞									
J—Width of Slotted Grille	Single	5									
	Double	6½									
	Triple	6½									
K—Width of Top Grille	Single	2⅞									
	Double	5⅞									
	Triple	5⅞									

All overall dimensions apply to liner box.
*PF-1 and PF-2 only furnished 35″ and higher.

SYMBOL	IDENTIFICATION
MF-1	Metal—Front Outlet—1 Grille
MF-2	Metal—Front Outlet—2 Grilles
MT-1	Metal—Top Outlet—1 Grille
MT-2	Metal—Top Outlet—2 Grilles
PF-1	Plaster—Front Outlet—1 Grille
PF-2	Plaster—Front Outlet—2 Grilles
MFS-1	Metal—Front Outlet—Short Panel—1 Grille
MFS-2	Metal—Front Outlet—Short Panel—2 Grilles
MTS-1	Metal—Top Outlet—Short Panel—1 Grille
MTS-2	Metal—Top Outlet—Short Panel—2 Grilles
PFS-1	Plaster—Front Outlet—Short Panel—1 Grille
PFS-2	Plaster—Front Outlet—Short Panel—2 Grilles
PTS-1	Plaster—Top Outlet—Short Panel—1 Grille
PTS-2	Plaster—Top Outlet—Short Panel—2 Grilles
WF-1	Wall—Front Outlet—1 Grille
WF-2	Wall—Front Outlet—2 Grilles
WFS-1	Wall—Front Outlet—Short Cabinet—1 Grille
WFS-2	Wall—Front Outlet—Short Cabinet—2 Grilles

Scientific Testing and Rating *of* CRANE CONCEALED RADIATORS

WITH the advent of the tubular type of direct cast iron radiator the term E.D.R. (equivalent direct radiation) has come into general use. In the past a square foot of radiation was ordinarily considered to be 144 square inches of surface; now, however, all ratings are given in terms of E.D.R., employing as an engineering standard the definition that a square foot of equivalent direct radiation is that amount of surface, regardless of the actual square inches, which will deliver 240 B.t.u. per hour.

In the past the old type of column radiation was rated on its physical dimensions only, that is, in actual square feet. When the above Engineering Standards were adopted it became necessary to obtain the rating of a radiator by actual test since we are no longer interested in the physical dimensions but are interested in the actual quantity of heat emitted.

In testing and rating radiators it is very important that a set of standard conditions be maintained. Consequently the American Society of Heating & Ventilating Engineers have established a Code for the testing of direct cast iron radiators. This code requires that the radiator be tested with steam at 1# gauge pressure and with a room temperature of 70° at the breathing level, that is, five feet above the floor. The heat emission of the radiator is then determined by measuring the condensation rate under these conditions. This data is then converted into B.t.u. per hour and the total B.t.u. emission divided by the Engineering Standard of 240 results in the equivalent direct radiation in square feet.

It is well known, however, that in actual practice low radiators of the window type seem to heat the room more satisfactorily and narrow radiators afford better comfort conditions than wide radiators. It remained for the University of Illinois, in bulletins #192 and #223 of the Engineering Experiment Station, to show that condensation rate is not a true measure of a radiator's performance.

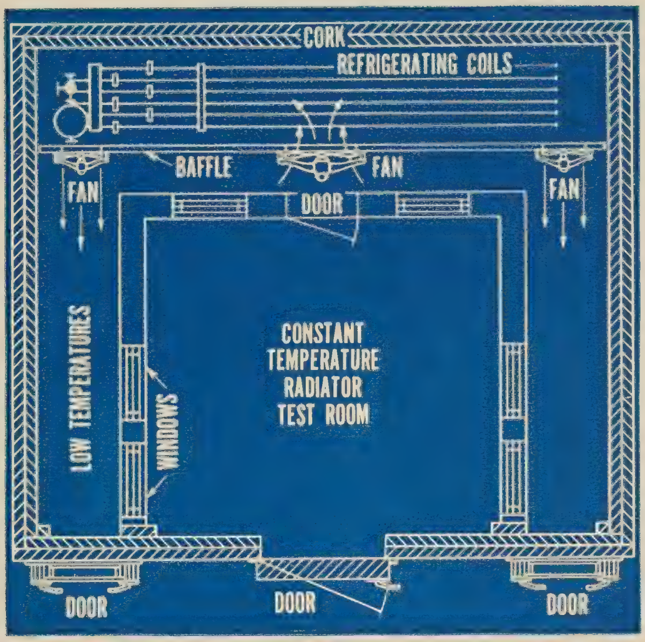


Fig. No. 1

It now becomes necessary to study the resultant room temperature conditions as well as the condensation rate effected by a radiator and from this data determine its rating in square feet of E.D.R. The factors which determine the rating of a radiator, as stated above in the case of direct cast iron radiators, were found to be even more important in the case of concealed radiators.

Description of Test Equipment

Crane engineers realized the necessity of accurate and scientific determination of all factors affecting the heating of a radiator and consequently it became apparent that elaborate equipment would be necessary for the proper determination of these factors.

A large refrigerator of 8000 cubic foot volume, lined with 8″ of cork, was constructed. In this immense refrigerator a typical living room was built having three walls exposed to the refrigerated air. Fig. No. 1 shows a plan view of the refrigerator, radiator test room, and refrigerating coils and fans. This radiator test room is of typical frame construction with windows and doors and with a basement and attic. The room is approximately 11 ft. square with an 11 ft. floor to ceiling height.

The refrigerating apparatus maintains any desired temperature on the exterior of the radiator test room. The radiator to be tested is placed in any desired position in the test room and by means of automatic controls the room temperature is maintained constant either at the breathing level 5 ft. above the floor, or at knee height 30″ above the floor. The automatic controls regulate the refrigerating apparatus to maintain these temperatures constant. The heat, therefore, flows out of the room through the walls at a uniform rate, and is absorbed by the refrigerant. This test room, therefore, is essentially a large calorimeter. Temperatures as low as 30° F. below zero have been attained outside the radiator test room.

Approximately 100 thermocouples are used in various locations throughout the radiator test room for the determination of air temperatures and surface temperatures. These thermocouples are so located that temperature gradients which indicate heat flow are obtained for all the walls, floor, and ceiling. These thermocouples have been calibrated against a Bureau of Standards Certified Beckman Thermometer having an accuracy of 1/100th of a degree. All temperature measurements are made by remote control utilizing a Type "K" Potentiometer, which comprises a combination electrical and optical system.

The condensate from the radiator on test is collected and weighed periodically on a special balance calibrated to 1/100th of a pound.

Consequently the whole system reflects a high degree of accuracy and precision in the control of the standard conditions and in obtaining the observed data necessary for accurately and scientifically rating direct or concealed radiators of all types.

Test Procedure

In performing a test the radiator is connected in place and supplied with dry steam at 1# gauge pressure. Extreme care is taken to be sure that the steam has a quality of 100%. The radiator is permitted to heat the room until a uniform heat flow is indicated by all thermocouples. When equilibrium has been attained in the test room the test is considered under way and the condensation rate is determined periodically, from which the heat emission of the radiator on test is accurately determined under specific and controlled conditions. All of the data is obtained under controlled standard conditions and therefore correction factors are not necessary. Furthermore, actual field conditions are duplicated.

This equipment, therefore, determines with extreme accuracy the condensation rate of the radiator and at the same time the room temperature gradients which are the index of comfort.

Rating Crane Concealed Radiators

Without the elaborate equipment described above for testing of radiators, it is practically impossible to rate concealed radiators correctly. A concealed radiator comprises essentially two units, that is, a radiator proper and the enclosure which houses the radiator.

The performance of a concealed radiator depends almost entirely on the enclosure characteristics. Consequently Crane engineers devoted considerable time and made hundreds of tests to determine the effect of enclosure characteristics on concealed radiator performance. As a result of this work, the correct inlet and outlet grille areas were determined and in addition to this the proper enclosure dimensions were obtained for each size of radiator.

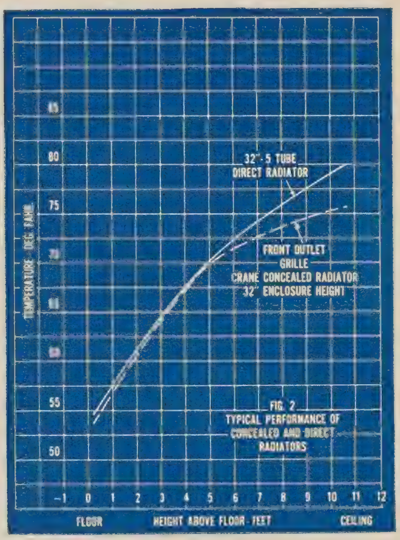


Fig. No. 2

Fig. No. 2 shows the typical performance of a Crane concealed radiator having a front outlet grille and a 32″ overall enclosure height. For comparison the performance of a

32″—5 tube direct cast iron radiator is also shown. It will be noted that the room temperature conditions in the living zone, namely, below the 5 ft. level, are practically the same, whereas in the portion of the room above the 5 ft. level the air temperatures are considerably less with the concealed radiator than with the direct radiator. This condition reflects a saving in steam consumption and substantiates the fact that condensation rate is not a true index of a radiator's performance. We are interested primarily in the comfort conditions in the living zone and a decrease in temperature at the ceiling is highly desirable.

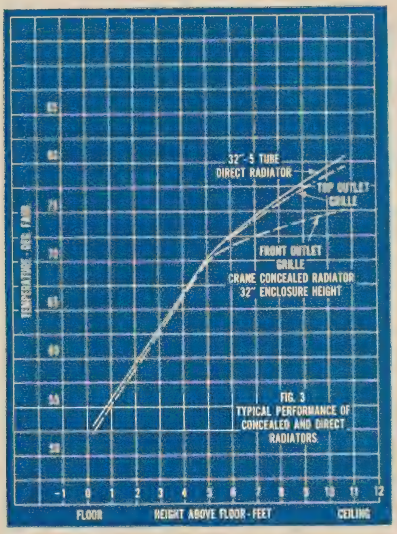


Fig. No. 3

Fig. No. 3 shows the performance curves for a Crane concealed radiator in a 32″ enclosure height but equipped with a top outlet. For comparison the performance of a 32″—5 tube direct cast iron radiator is also shown. It will be noted that the comfort conditions set up in the room by a concealed radiator with a top outlet is practically the same as the direct cast iron radiator.

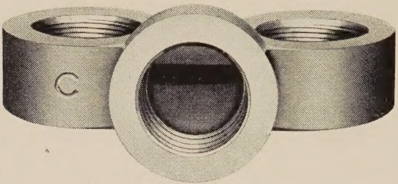
The performance curve of the same Crane concealed radiator is shown also when the enclosure is equipped with a front outlet. The comfort conditions set up in the room in this case are practically the same as in the case with the radiator having the top outlet enclosure, except for a decided reduction in ceiling temperatures resulting in a decrease in steam consumption. Consequently in "heating effect" the concealed radiator with the front outlet enclosure performs the same work as the concealed radiator with the top outlet enclosure although the condensation rate or steam consumption is considerably less. This phenomena is termed "heating effect." One is justified, therefore, in rating the concealed radiator equipped with a front outlet enclosure on the basis of the condensation rate obtained when this radiator is tested with an enclosure having a top outlet. On the other hand, any concealed radiator equipped with a top outlet cannot be given credit for "heating effect" because the room temperature conditions effected by the concealed radiator with a top outlet enclosure are the same as if a direct cast iron radiator were used.

We have, therefore, established one rating for the Crane concealed radiators whether a top or front outlet enclosure is used. The ratings, however, are based on the condensation rate using top outlet enclosures. It is highly desirable, therefore, that in order for a heating system to operate with greatest economy, front outlet enclosures should be used. Radiators equipped with front outlet enclosures will give the same comfort conditions with decreased steam consumption. On the other hand, if the system is installed with top outlet enclosures the comfort conditions will still be the same, the ceiling temperatures will rise considerably and consequently more steam will be required.

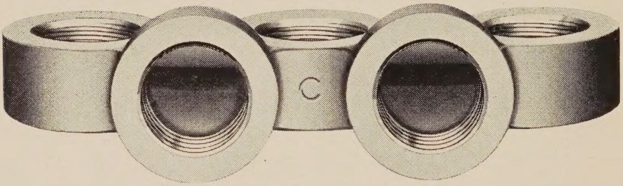
Application of Crane Concealed Radiators

Since Crane Concealed Radiators are rated in terms of E.D.R. (equivalent direct radiation) selection is made in the same manner as in the case of direct cast iron radiators. Calculations for radiation requirements, therefore, are made in the customary manner and concealed radiators are selected from the rating tables on the basis of square feet of E.D.R. desired.

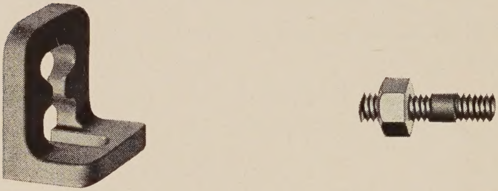
RADIATOR ACCESSORIES



Manifold for Double Depth

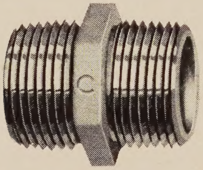


Manifold for Triple Depth



Adjustable Wall Bracket and Stud

Adjustable Leg



Right and Left Hand Hexagon Nipple

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Everything for any heating or plumbing installation

•

THE Crane line of cast iron concealed radiators is still another forward step in a growth that has been unbroken through the 77 years of Crane service. Crane service to builders includes besides these concealed radiators, a complete new improved line of sectional and square jacketed boilers, direct and shielded radiators, plumbing materials whose quality needs no comment, and valves and fittings that are accepted as the standard of comparison. From this one dependable source, you can draw everything for any heating or plumbing installation.

For protection of the public and assurance of satisfactory installation, Crane heating materials are sold only through responsible heating contractors, just as Crane plumbing materials are sold only through responsible plumbing contractors. Recognizing that the interests of public contractor and manufacturer are identical, the Crane organization and its resources are devoted to closer cooperation with architect, contractor, and builder.

On monthly payments, if desired

For modernizing work Crane heating materials can be fully installed on the Crane Budget Plan. Under this plan, the buyer pays nothing until everything is in place and extra value added to his property. Then he pays only a small sum down, a small sum monthly. See the new Crane products at nearby Crane Exhibit Rooms. Take your customers to see them.

Valves **CRANE** *Fittings*

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